

MALOCCLUSION STATUS AND ORTHODONTIC TREATMENT  
NEEDS OF 14-YEAR-OLD YEMENI ADOLESCENTS

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## ABSTRACT

The aim of this study was to develop a national database on the prevalence, severity of malocclusion and orthodontic treatment needs among Yemeni adolescents. Other variables included were geographical zones, gender and urban-rural locations.

A multi-stage stratified random sample of 2400 subjects from 60 schools with equal proportion of male and female were selected from nine governorates covering the whole topography of Yemen (coastal, plateau, mountains, desert and islands). Measuring instruments were the conventional FDI/WHO method of occlusal traits (Baume et al., 1973; Berzoukov et al., 1979) and the Index of Orthodontic Treatment Needs (IOTN), (Brooke and Shaw, 1989; Richmond et al., 1995). Other occlusal traits included based on clinical oral examination were canine relationship and bimaxillary protrusion. Data collection was carried out by one examiner assisted by a recorder, using mouth mirror and the orthodontic ruler, with patient seating on a portable dental chair or classroom chair and natural light. Prior to the oral examination, the examiner was calibrated against a gold standard on children of the same age in Malaysia. A pilot study was again conducted on Yemeni children in Thamar a week before data collection began. All information gathered was checked for completeness and data was transferred into a laptop using the SPSS software data entry program. Analysis was carried out using the SPSS version 15 program.

Measurement of occlusal traits based on FDI/WHO objective method showed that dental discrepancies was observed in 14.6% (impacted 5.7%, congenitally absent 2.2%, retained deciduous 3.2%, missing due to extraction or trauma 2.8% and supernumerary 0.7%) of the sample examined. Crowding was observed in 53.3% of the sample, of whom 27.8% had crowding of  $\geq 2$  mm. Spacing was observed in 2.9% of the sample, mostly in the maxilla. Midline diastema was also found to occur in 5.4% of the sample

examined. Asymmetrical molar relationship was only observed in 11.3% of the sample, mostly of Class I/Class II relationship (9.4%). Overjet was observed in 9.1% of the sample. Only a small proportion (2%) had anterior crossbite, deepbite (10.3%), anterior openbite (4.5%), posterior openbite (2.9%), posterior crossbite (5.2%) and 2.7% scissor bite. Other occlusal traits measured clinically were partially erupted teeth (6.5%), Class II canine relationship (right 17.4%, left 18.4%), Class III canine relationship (right 1.8%, left 1.7%) and bimaxillary protrusion (9.3%).

Normative orthodontic treatment needs as assessed using the Dental Health Component criteria of (IOTN) showed that slightly less than half (44.3%) of the adolescents needed some form of orthodontic treatment (Grades 3,4 and 5). Of this a quarter (26.8%) ‘definitely’ needed treatment. Assessment of whether examiner or subject perceived orthodontic treatment need was made using the Aesthetic Component of IOTN. Findings showed that examiner perceived at least 28.9% of the adolescents in this study needed orthodontic treatment (18.8% ‘borderline’ and 10.1% ‘definite’ need); on the contrary subjects themselves perceived a much lower proportion (13.4%). Further analysis was carried out to compare the findings according to gender, urban-rural areas and country’s topography.

In conclusion, findings showed the prevalence of malocclusion was 74.4% when measured using the conventional WHO/FDI criteria. But when measured with Index of IOTN, the prevalence of malocclusion observed was 68.2%. Although both examiner measurements of normative and aesthetic perceived need indicated a relatively high, subjects self-perceived needs was however low. These findings suggest a need for a more conservative treatment approach in dealing with malocclusion problems among Yemeni adolescents.

## DECLARATION

I certify that this thesis is based on my own independent work, except where acknowledged in the text or by reference. No part of this work has been submitted for a degree or diploma to this or any other university.

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## LIST OF ABBREVIATIONS USED IN THE THESIS

Abbreviation	Meaning
ABO	American Board of Orthodontics
AC	Aesthetic Component
AD	Anno Domini
BC	Before Christ
CalMod	California modification
COCSTOC	Commission on Classification and Statistics for Oral Conditions
DAI	Dental Aesthetic Index
DHC	Dental Health Component
FDI	Fédération Dentaire Internationale
HLDI	Handicapping Labio-lingual Deviations Index
HMAR	Handicapping Malocclusion Assessment Record
ICON	Index of Complexity Outcome and Need
IOTN	Index of Orthodontic Treatment Need
MERM	Method for Epidemiological Registration of Malocclusion
MOCDO	Missing, Overjet, Crossbites, Displacement, Overbite
MSE	Malocclusion Severity Estimate
NOTI	Need for Orthodontic Treatment Index
°C	Degree Celsius
OFI	Occlusal Feature Index
PAR	Peer Assessment Rating
Per annum	Per year
SCAN	Index of Standardised Continuum of Aesthetic Need
TDI	Treatment Difficulty Index
TPI	Treatment Priority Index
WHO	World Health Organisation

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